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ZERO BUDGET NATURAL FARMING- A STEP TOWARDS SUSTAINABLE FUTURE OF AGRICULTURE

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Agriculture is the primary livelihood source of 58 percent populations in India. Green revolution became most popular in the early 1960s with the purpose of increasing food production by adopting advanced methods and technologies such as the use of High Yielding Variety (HYV) seeds, advanced technologies, irrigation facilities, pesticides, and fertilizers, etc. With that the major drawbacks of green revolution was confined only for a few crops such as wheat, paddy, and maize but also for few areas of countries such as Punjab, Haryana, and Western Uttar Pradesh and is costly also. The farming community has found themselves in the vicious cycle of debt with the high input production costs, high-interest rates for credit, the volatile market prices for crops, the rising costs of fossil fuel-based inputs and private seeds, etc. and they are unlikely forced to take loan from money lenders and institutional sources.

Many agricultural scientists argue that excessive usage of chemicals in the field is not only proving counter-productive in the long term sense, but also it has irreparable damage to soil health and environment as well. So, the biggest challenge is improving the soil health of cultivated land by using non-chemicals to attain sustainability in production and to improve the quality of food. For that, an eco friendly or farmer's friendly alternate system of farming is now becoming most popular among the farming community is Zero Budget Natural Farming, which is crucial in achieving the ambitious goal of doubling farmer's income by 2022 with low input cost and to support sustainable agriculture.

Concept of Zero Budget Natural Farming

Zero Budget Natural Farming is a unique method of chemical free agriculture through indigenous practices pioneered by agricultural scientist Subhash Palekar, in Karnataka. In the mid of 1990s as an alternative to the green revolution's method to reduce the use of chemical

fertilizers and pesticides and intensive irrigation methods as well as. ZBNF is based on agro-ecology and also called as Zero Budget because the aim is to bring down the cost of production and in which there is no need to spend too much credit to farmers on buying inputs such fertilizers, pesticides, insecticides, and intensive irrigation practices and get back on pre-green revolution or traditional style of farming. Further, Palekar claims that rising cost of inputs has always been not only a major cause of indebtedness but also leads to increase of suicide cases among farmers, whereas at the same time the impacts of chemicals on the environment and soil fertility is devastating.

Hence, with ZBNF there is no need to expend too much money on such inputs or while borrowing loans from middlemen. With a greater extent the cost of production could be reduced and farming could be made into a zero budget. Thus, this will help in breaking the debt vicious cycle for many small and marginal farmers. Apart from this, ZBNF helps to improve the soil health and enriches with essential nutritive elements and also provide the environmental benefits. The ZBNF also supports soil aeration, minimal of watering, intercropping, bunds and topsoil mulching and discourages intensive irrigation and deep ploughing methods. Although, Palker is not in favor of vermin-composting, as which is the cornerstone of typical organic farming, the reason is that it does not prevent from toxic metals, the most common composting worm in ZBNF is the European red wiggler (*Eisenia fetida*) to Indian soils, these worms absorb toxic metals and poison groundwater and soil. Hence, the ZBNF is mainly based on chemicals free agriculture, which is drawn from traditional Indian practices at field conditions.

The four pillars of ZBNF

The four pillars and some traditional practices of ZBNF are following;

1. Jeevamrutha/Jivamrita: Generally, this traditional practice is based on a fermented microbial culture. It provides nutrients to the soil. It acts as a catalyst agent to grow the activity of microorganisms and also increases earthworm activity in the soil. The duration period of fermentation process is about for 48 hour, during this process the aerobic and anaerobic bacteria present in the cow dung and urine multiply as they feed the pulse flour in the solution, which is an organic ingredient. Further, a handful undisturbed soil is also added to the preparation to immunize native bacteria and other organisms as well as. Jeevamrutha also helps to protect the plants against fungal and bacteria plant diseases. This practice is only

needed in the starting 3 years of the transition, thereafter the whole system become self-sustaining themselves.

Preparation: It is made up of cow dung (10 Kg), cow urine (10 lit), jaggery (2Kg), pulse flour (2Kg) in the 200 lit of water. Thereafter, the solution has to be stir thoroughly and then let it be fermented for 48 hours in the shade.

Application: Generally, the prepared mixture of 200 liters of Jeevamrutha is enough for one acre of land. It has to be applied to the crops twice a month with irrigation water or as 10% foliar spray.

2. Bijamrita/Beejamrutha: Beejamrutha is a treatment of seed, seedlings and planting material. It is very effective to protect young roots from fungus, soil-borne and seed-borne diseases, which is mainly affected during the monsoon. It is made up of local cow dung (having natural fungicide), and cow urine (having anti-bacterial liquid), lime and a handful soil. Further, Beejamrutha is added to the seeds of any crop, coat them properly, and mixing them thoroughly by hand; then let it be dry well and then use it for sowing. For treating leguminous seeds, just quickly dip them and let them dry well for a while.

Preparation: The mixture of Beejamrutha is made up of cow dung (5Kg), Cow urine (5 lit), water (20 lit), lime (50 g), and a handful soil.

3. Mulching: Mulching practice helps to conserve soil moisture by reducing evaporation. Mulching can be done by three types are described below:

a) Soil Mulching: Protects topsoil during cultivation. Due to this soil does not destroy by tilling. It also helps to enhance aeration and water retention in the soil. Palekar suggested that one should avoid the deep ploughing, as it will affect active microorganisms in the soil.

b) Straw Mulching: It is the dried biomass waste of previous crops. It can be composed anywhere, when soil is covered with the dead materials of any living organism such as plants, animals, etc. This practice is done to improve the soil fertility rate where dry organic material decomposes and form humus through the activity of the soil biota, which is activated by microbial.

c) Live Mulching (Symbiotic intercrops and Mixed crops): This practice is pivotal to develop multiple cropping patterns of monocotyledons (Monocots; Monocotyledons seedling have one seed leaf) and dicotyledons (dicotos; Dicotyledons seedling have two seed leaf)

grown in the same field, which is done to supply all essential elements or nutrients to the soil and crops as well as. Further, legumes are categorized under the dicot group as they are nitrogen-fixing plants. Whereas rice and wheat are monocots because they are essential to supply elements like potash, phosphate and sulphur to soil and crops.

4. Waaphasa – Moisture: Palekar claims that plant roots do not require too much water for irrigation, but the plant roots need only water vapor. Waaphasa is the condition in which both air and water molecules are presented in the soil which helps to reduce the requirement of irrigation. He suggested that irrigation should be reduced and used it only at during noon.

Advantages:

- Farmers practicing ZBNF gets higher yields at low input cost.
- Eliminates the usages of chemical pesticides and promotes good agronomic practices.
- Promotes regenerative agriculture, improve soil biodiversity and productivity.
- Ensures decent livelihoods to smallholder farmers.
- Restores or enhances the ecosystem's health through diverse, multi-layered cropping systems.
- Anyone who is having half an acre of land can start with ZBNF at low cost.
- Using ZBNF techniques, one can convert even the most infertile land into a fertile one.
- Helps to ensure Women's empowerment.
- Enhances the nutritive value and quality of food without any implementation of chemicals.

Government initiatives to promote ZBNF

- Government of India has been promoting organic farming through the schemes of Paramparagat Krishi Vikas Yojana (PKVY) and Rashtriya Krishi Vikas Yojana (RKVY).
- In the revised guidelines of PKVY scheme during the year of 2018 included various organic farming models like Natural Farming, Zero Budget Natural Farming (ZBNF) Rishi Farming, Vedic Farming, Cow Farming, Homa Farming, etc. and flexibility is given to states or depending on farmer's choice to adopt any model of organic farming including ZBNF.

- In the RKVY scheme, organic farming/ natural farming project components are considered by the State Level Sanctioning Committee (SLSC) according to their priority/choice.

Conclusion

Across the world, agriculture is facing multiple problems in the form of extreme changes in climate like floods and droughts or other factors such as soil degradation due to excessive use of chemical fertilizers, soil salinity and water shortage. Therefore, to ensure food security, producing more with optimum use of available resources with minimum cost and building the resilience of smallholder and marginal farmers are very important in agriculture sector. Consequently, agricultural scientists suggested that it's as time when we need to rework on traditional strategies so that farming would be compatible with nature. Hence, there is a need of global transition to a more resilient and sustainable agriculture, which is less dependent on use of agrochemicals and mainly draws more on natural biological and ecosystem processes. So, the new system of farming which is based on zero budget will freed the farmers from the dept trap and it also helps to make farming as an economically viable venture.

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